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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,722	09/07/2004	William F Walker	00756-03	4902
34444 7590 01/08/2009 UNIVERSITY OF VIRGINIA PATENT FOUNDATION 250 WEST MAIN STREET, SUITE 300 CHARLOTTESVILLE, VA 22902				
EXAMINER LARYEA, LAWRENCE N				
ART UNIT 3768		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/506,722

**Applicant(s)**

WALKER ET AL.

**Examiner**

Lawrence N. Laryea

**Art Unit**

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 11-15, 18-35, 40-54 and 55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-15, 18-35, 40-54 and 55 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsman's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

Examiner acknowledges Applicant's amendment and remarks filed **30 January 2008**.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 13-15, 28, 30, 35, 45 are rejected under 35 U.S.C. 102(e) as being anticipated by **Chen et al (Patent 6,139,496)**.

3. **Chen et al** teach an ultrasonic imaging system capable of producing images of a target, said system comprising: a housing; the display unit (**228**) defining a planar region , wherein said transducer array (**221**) and said display unit are integrated with the housing, wherein said display unit lies in a plane that is substantially parallel to said two-dimensional transducer array (**See Fig. 4**); and a beamformer (**See Col.9, lines 35-51**, the two-dimensional transducer array is configured with activatable elements for transmission and reception of acoustic **beam formed** ) disposed within said housing, said beamformer in communication with said two-dimensional transducer array, and generating an image corresponding to an image plane located below the plane of the display, wherein said image represents a portion of said image plane that is in substantial alignment with said planar region of said display unit (**See Figs 2-4**).

Art Unit: 3768

4. **Re Claims 2-3: Chen et al** teach an ultrasonic imaging system wherein controllers can be used to select (zoom) the depth of the images (**See Col.7, lines 45-67; Col.8, lines 1-13**).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5,11,12,19,23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen et al** as applied in claim 1, in view of **Robinson (US Patent 6,544,177)**.

**Chen et al** teach the claim invention wherein the ultrasonic imaging system is capable of producing 3D images (**See Col.1, lines 19-23**) **Chen et al** does not teach that the image could be formed from 3D data set by compounding a plurality of images located at a different depth.

7. **Robinson** teaches an ultrasonic imaging system wherein image if formed from 3D data set (**See Claims 6,8**) by compounding a plurality of images located at a different depth (**See Col.7, lines 1-46, Col.7, lines 1-46; Col.9, lines 1-64**).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic imaging system of **Chen et al** wherein the image is formed from 3D data set by compounding a plurality of images located at a

different depth of **Robinson** in order to produce spatial compound image (s) (quality improved images) as taught by **Robinson**.

8. Claims 6-9,20,22,27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen et al** as applied in claims 1, in view of **Randell et al (US Patent 6962566)**.

9. **Chen et al** teach the claim invention see rejection supra ,**Chen et al** does not teach that an ultrasonic imaging system has a volume of less than about 4 and 48 cubic inches and weighs less than about 2 pounds.

10. **Randell et al** teach medical diagnostic ultrasonic system wherein weight and volume of ultrasonic system is put in consideration in order to have a diagnostic ultrasonic system which is lighter and easier to manage or carry during medical diagnostic procedures (**See Col. 35, Line 23-51**) and a processor for processing envelope images whereby appearance of speckle in the displayed image is reduced (**See Col. 4, Lines 24-35; Col. 4, Lines 52-55, Col. 8, Lines 61-67; Col. 9, Lines 1-6; Col. 9, Lines 52-61**).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic imaging system of **Chen et al** wherein the portable medical diagnostic ultrasonic system where has a volume of less than about 4 and 48 cubic inches and weight less than about 2 pounds in order to have a diagnostic ultrasonic system which is lighter and easier to manage or carry during medical diagnostic procedures (**See Col. 35, Line 23-51**) as taught by **Randell et al**.

Art Unit: 3768

11. Claims 21 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen et al** as applied in claim 1, in view of **O'Donnell et al (US Patent 5,014,712)**.

12. **Chen et al** teach the claim invention see rejection supra ,**Chen et al** does not teach that an ultrasonic imaging system includes using a coded excitation scheme to increase the effective signal to noise ratio.

13. **O'Donnell et al** teach medical diagnostic ultrasonic imaging system includes using a coded excitation scheme to increase the effective signal to noise ratio. (**See abstract**) in order to increase the resolution of the image (**See Col.1, lines 7-13 and Col.1, lines 15-29**).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic imaging system of **Chen et al** includes using a coded excitation scheme to increase the effective signal to noise ratio (**See abstract**) of **Chen et al** in order to increase the resolution of the image (**See Col.1, lines 7-13 and Col.1, lines 15-29**) as taught by **O'Donnell et al** .

14. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen et al** as applied in claim 1, in view of **Green (US Patent 4,730,495)**.

15. **Chen et al** teach the claim invention see rejection supra ,**Chen et al** does not teach that an ultrasonic imaging system uses unfocused transmit beam.

16. **Green** teaches medical diagnostic ultrasonic imaging system which uses unfocused transmit beam in to a target for rapid acquisition of complete images at a plane. (See Col.1, lines 7-13 and Col.1, lines 15-29).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic imaging system of **Chen et al** to include using unfocused transmit beam in to a target for rapid acquisition of complete images at a plane as taught by **Green**.

17. Claims 31-34, 40-44, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen et al** as applied in claim 1 in view of **Imran et al (Patent 6251073)**.

18. **Chen et al** teach the claim invention see rejection supra ,**Chen et al** does not teach that an ultrasonic imaging system includes at least one passage in communication with said system wherein a needle or tool can be inserted into said passage and said location of said needle or tool is tracked and displayed on said display unit relative to said passage and the transducer comprises a plurality of piezoelectric material.

19. **Imran et al** teach a miniaturized ultrasonic imaging system capable of producing images wherein disclose there is at least one passage (**recess**) in communication with said system wherein a needle or tool can be inserted into said passage and said location of said needle or tool is tracked and displayed on said display unit relative to said passage (See Col. 10 Line 8-45 and Col.3 Line 28-32 and Figs 1 and 6) and the transducer has a plurality of piezoelectric material (See Col. 3 Line 39-53 ).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic imaging system of **Chen et al** to include at least one passage (**recess**) in communication with said system wherein a needle or medical tool can be inserted into said passage of **Imran et al** in order to perform variety of medical diagnostic procedures (**See Col. 2, line 21-23**) as taught by **Imran et al**.

20. Claims 18,21,22,46-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen et al** as applied in claim 1, in view of **Hashimoto et al (US Patent 6,245,017)**.

**Chen et al** teach the claim invention see rejection supra ,**Chen et al** does not teach that the image is C-Mode.

21. **Hashimoto et al** teach an ultrasonic imaging system wherein an image is C-Mode in order to arbitrarily set any depth within 3D region of interest during blood flow measurements (**See Col.13, lines 50-67; Col.14, lines 1-40**).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic imaging system of **Chen et al** wherein an image is C-Mode in order to arbitrarily set any depth within 3D region of interest, during blood flow measurements as taught by **Hashimoto et al**.

#### ***Response to Arguments***

22. Applicant's arguments with respect to claims 1-9,11-15,18-34,40-55 have been considered but are moot in view of the new ground(s) of rejection.



Art Unit: 3768

Claims 1-9,11-15,18-35,40-55 are now pending. The Examiner acknowledges the amendments to Claims 1-9,11-15,18-30,32-35, 45,46 and as well as the cancellation of claims 10,16,17 and 36-39, and the addition of new claims 49-55.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence N. Laryea whose telephone number is 571-272-9060. The examiner can normally be reached on 9:30 a.m.-5:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

LNL

/Eric F Winakur/  
Primary Examiner, Art Unit 3768